



*Sheila Dixon*  
Mayor

# Floodplain Management and Sea level Rise In Baltimore City



Douglas  
McCoach, III  
Director

*Peter G. Conrad, AICP*



**Flooding from  
Hurricane Isabel**



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# Floodplain Management in Baltimore

## Overview

- Flooding History
- Floodplain Management and the NFIP
- Baltimore's Map Update Process
- Climate Change
- Sea level Rise



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McCoach, III  
Director*

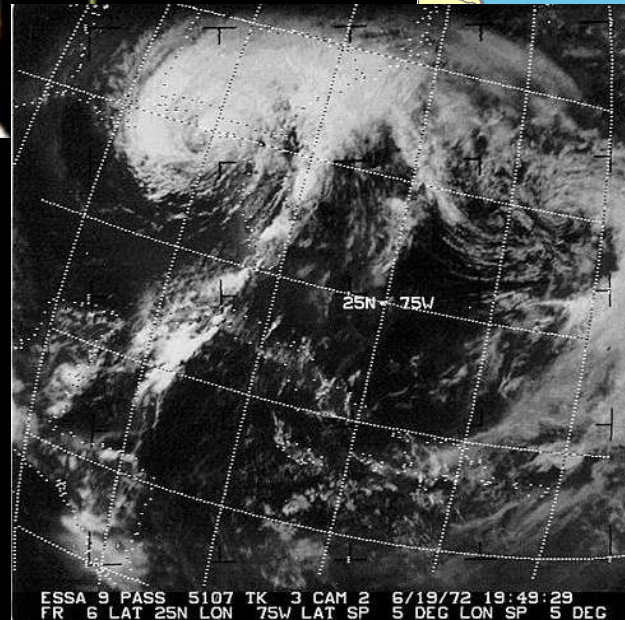
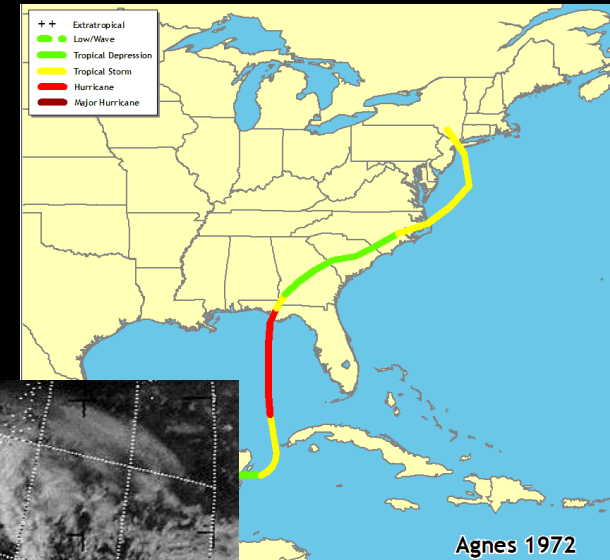
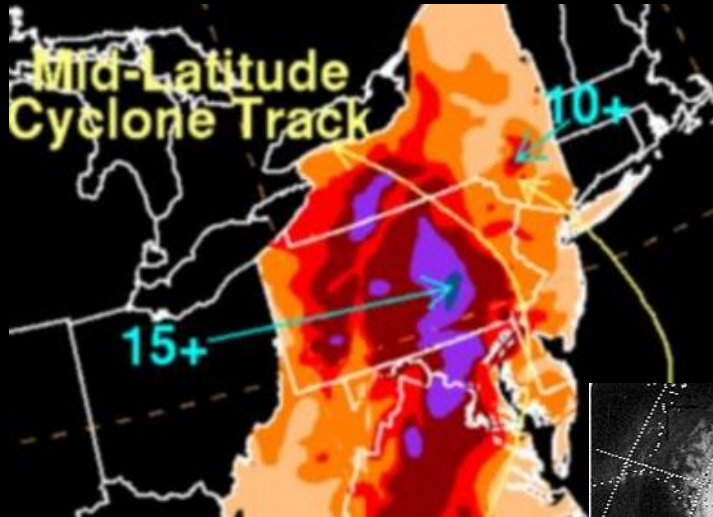
NATIONAL FLOOD INSURANCE PROGRAM	
<b>FIRM</b> FLOOD INSURANCE RATE MAP	
CITY OF BALTIMORE, MARYLAND INDEPENDENT CITY	
PANEL 11 OF 17 (SEE MAP INDEX FOR PANELS NOT PRINTED)	
 PANEL LOCATION	
COMMUNITY-PANEL NUMBER 240087 0011 D	
MAP REVISED: SEPTEMBER 30, 1988	
	Federal Emergency Management Agency



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# Floodplain Management in Baltimore

## Agnes – Rainfall from a Tropical Storm



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# Floodplain Management in Baltimore

## Agnes – Rainfall from a Tropical Storm



June 22, 1972

The bridge on the Patapsco Avenue extension, which connects Caton Avenue and Potee Street, became a raging river after more than seven inches of rain fell during Tropical Storm Agnes.

*File photo by Frank R. Gardina*



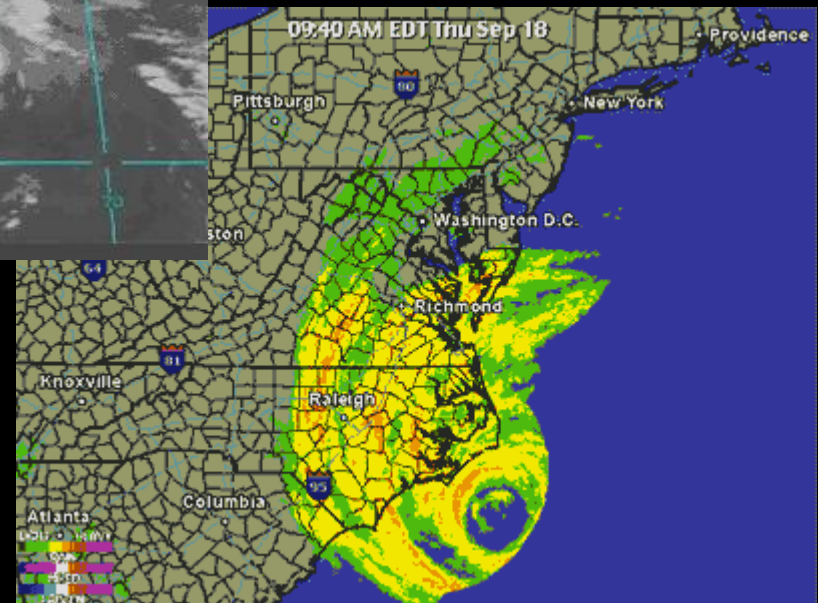
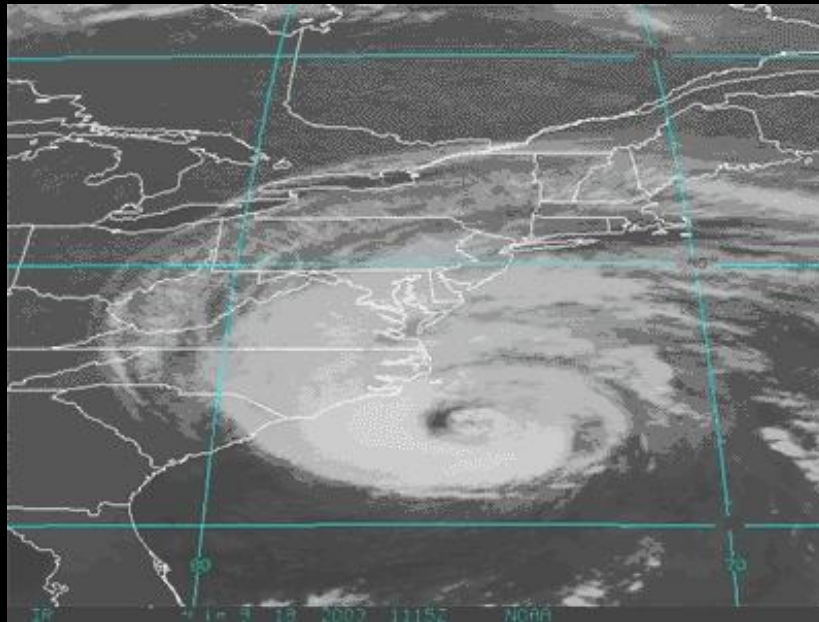
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# Floodplain Management in Baltimore

## Isabel – Tidal Surge from a tropical storm



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## Isabel – Tidal Surge from a tropical storm



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## Isabel – Tidal Surge from a tropical storm



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# Floodplain Management in Baltimore

## Federal National Flood Insurance Program



NATIONAL  
FLOOD  
INSURANCE  
PROGRAM



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# Floodplain Management in Baltimore

## Baltimore joined NFIP in 1974



### FLOOD INSURANCE STUDY



CITY OF BALTIMORE,  
MARYLAND  
INDEPENDENT CITY



SEPTEMBER 30, 1988



Federal Emergency Management Agency

COMMUNITY NUMBER - 240087



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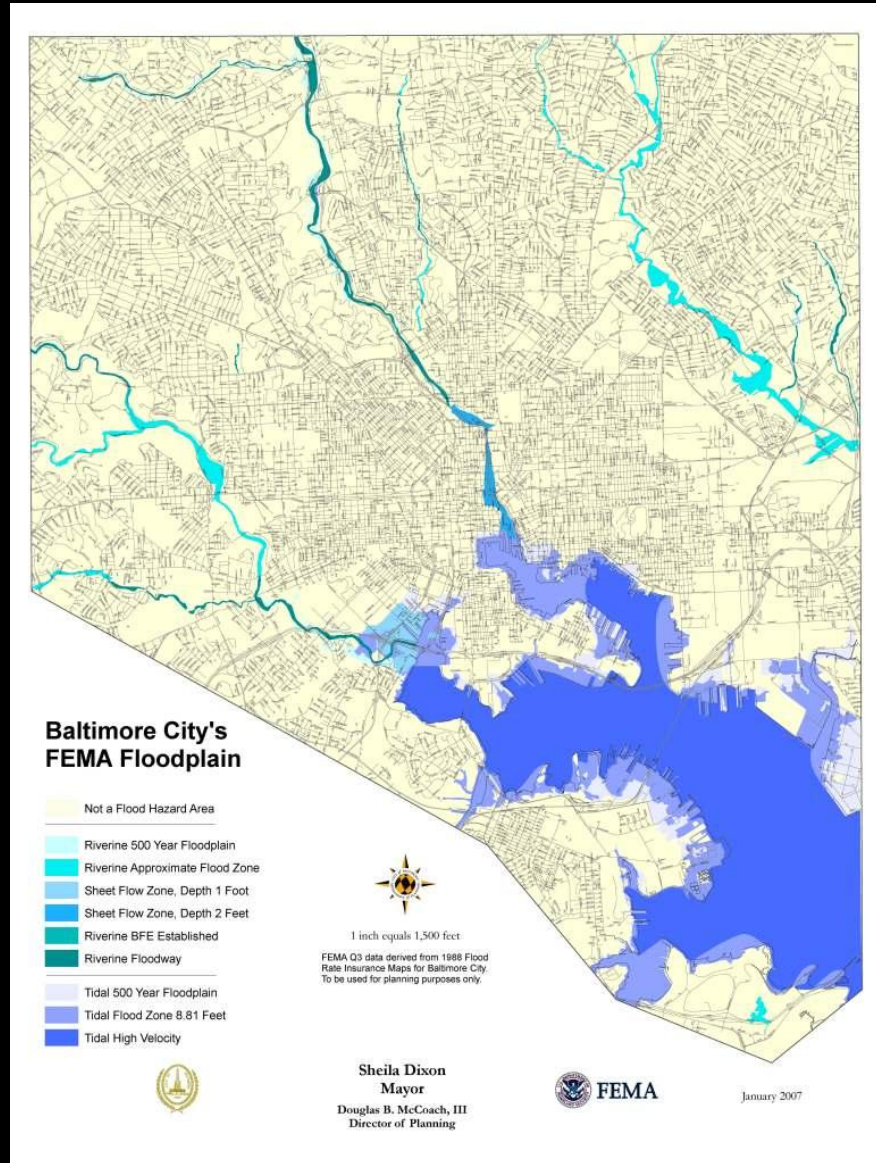
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# Floodplain Management in Baltimore

## Current FEMA map for Baltimore City



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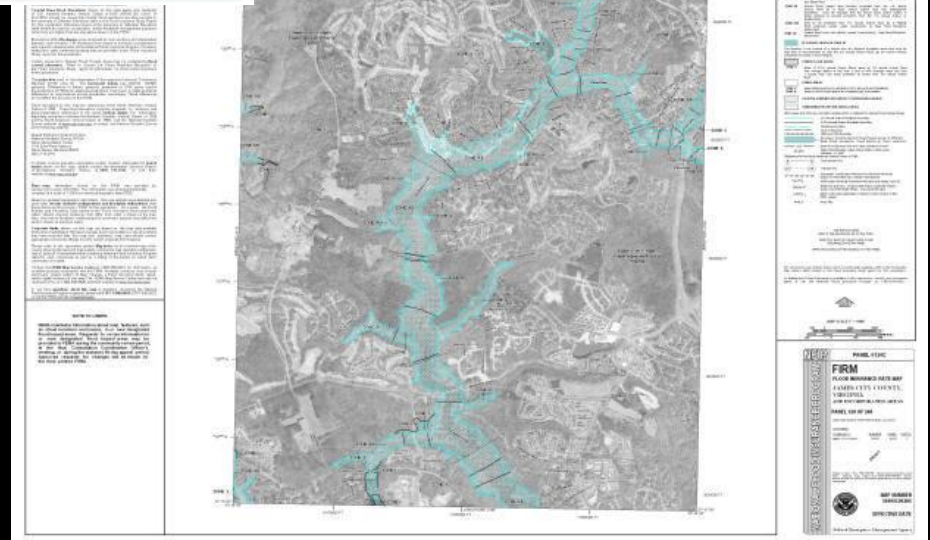




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# Floodplain Management in Baltimore

## FEMA Map Modernization



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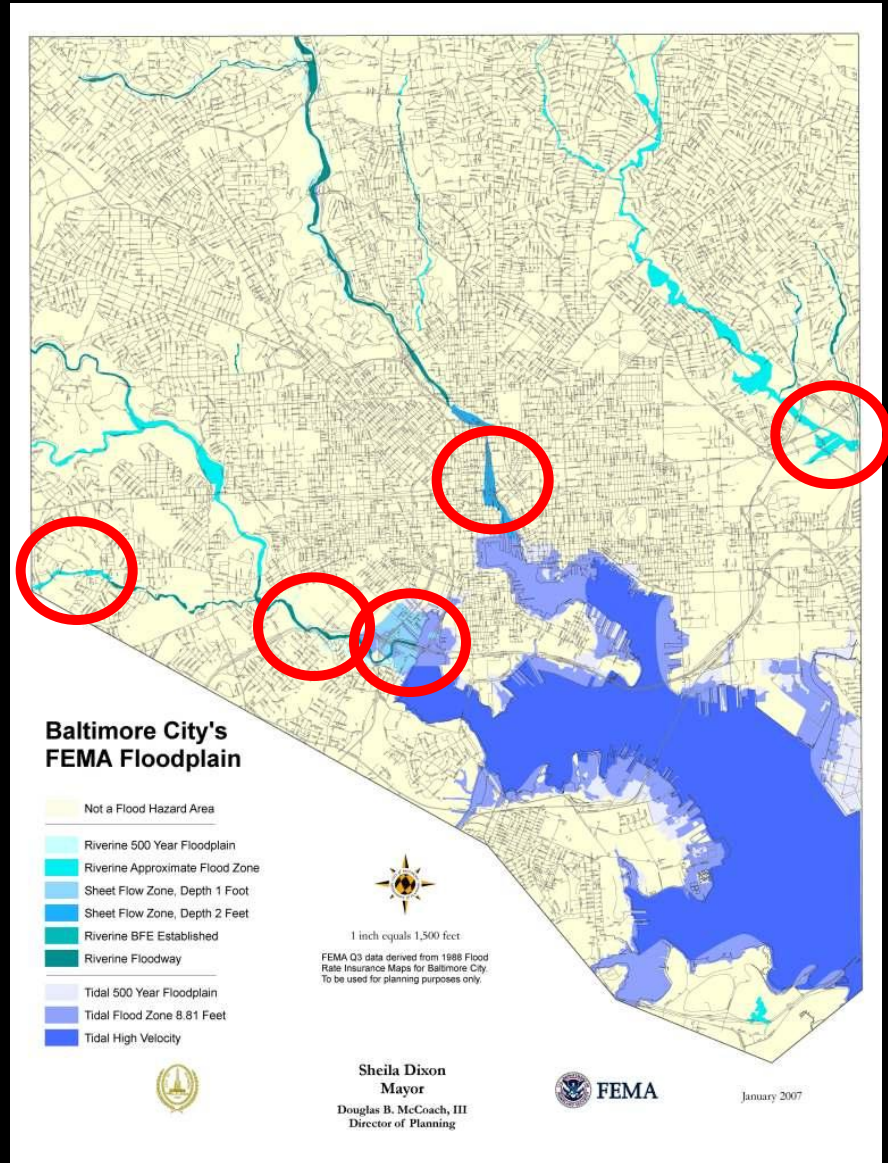
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# Floodplain Management in Baltimore

## New Study Areas



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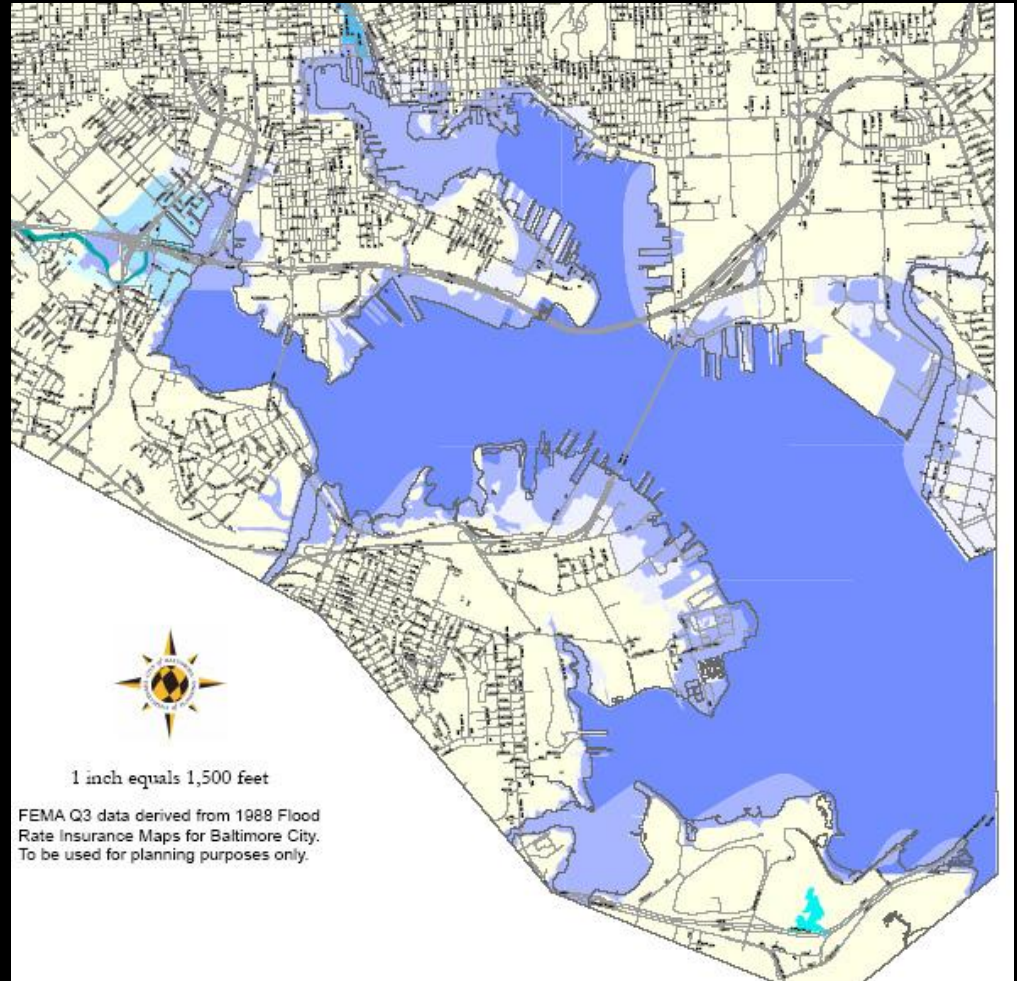
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# Floodplain Management in Baltimore

## Tidal Flood Zone



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# Climate Change and Sea Level Rise

## Intergovernmental Panel on Climate Change



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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



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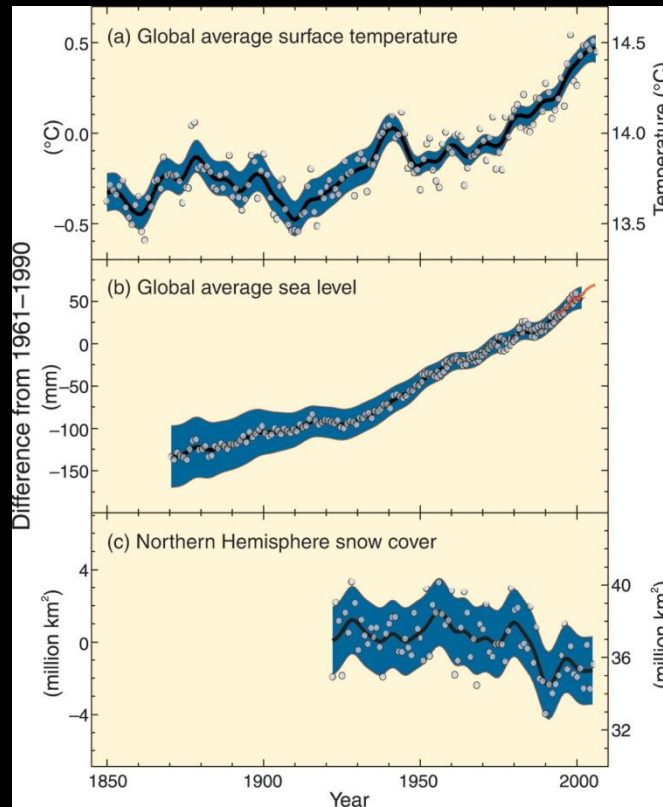




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# Climate Change and Sea Level Rise

## Intergovernmental Panel on Climate Change



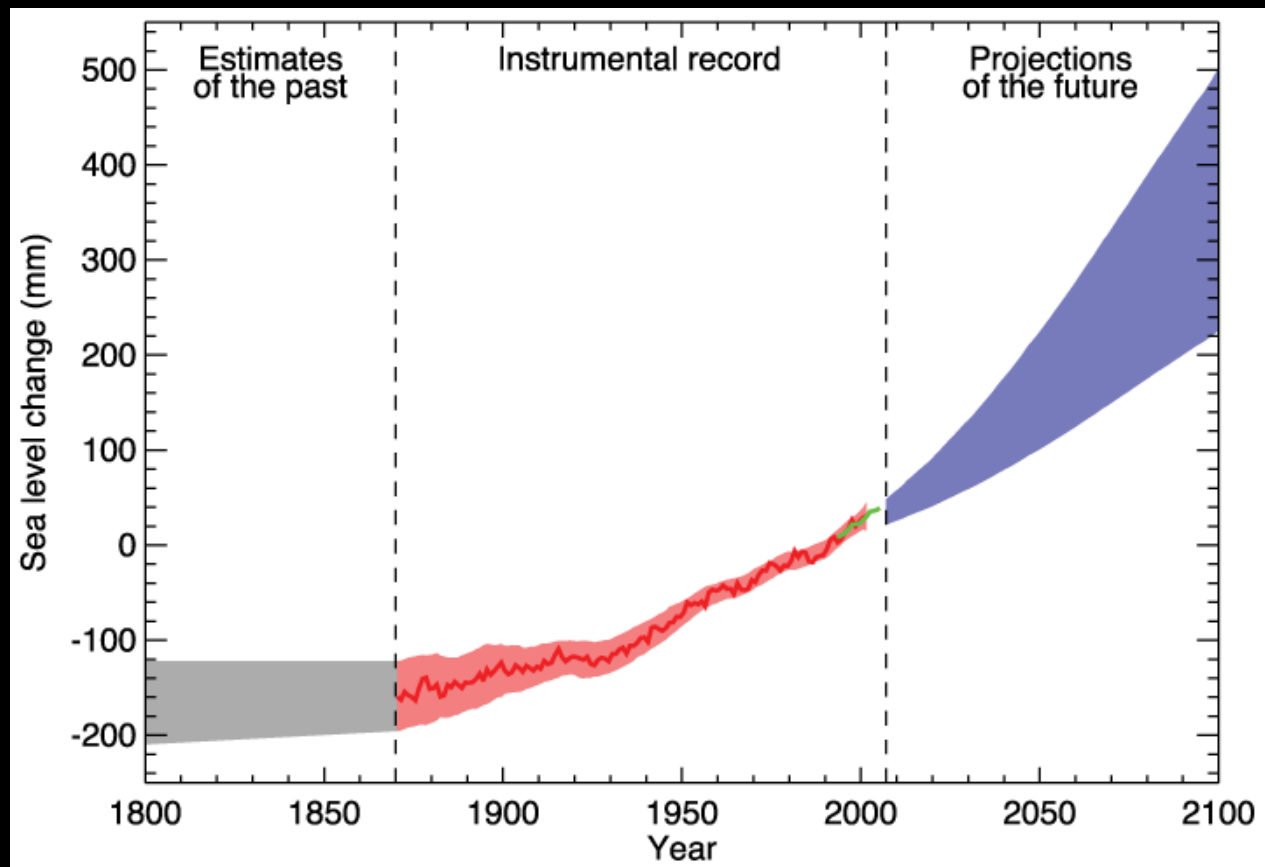
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# Climate Change and Sea Level Rise

## Sea Level Rise Science



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# Climate Change and Sea Level Rise

## Sea Level Rise Science

**Table SPM-2.** Projected globally averaged surface warming and sea level rise at the end of the 21st century for different model cases. The sea level projections do not include uncertainties in carbon-cycle feedbacks, because a basis in published literature is lacking. {10.5, 10.6, Table 10.7}

Case	Temperature Change (°C at 2090-2099 relative to 1980-1999) <sup>a</sup>		Sea Level Rise (m at 2090-2099 relative to 1980-1999)
	Best estimate	Likely range	Model-based range excluding future rapid dynamical changes in ice flow
Constant Year 2000 concentrations <sup>c</sup>	0.6	0.3 – 0.9	NA
B1 scenario	1.8	1.1 – 2.9	0.18 – 0.38
A1T scenario	2.4	1.4 – 3.8	0.20 – 0.45
B2 scenario	2.4	1.4 – 3.8	0.20 – 0.43
A1B scenario	2.8	1.7 – 4.4	0.21 – 0.48
A2 scenario	3.4	2.0 – 5.4	0.23 – 0.51
A1FI scenario	4.0	2.4 – 6.4	0.26 – 0.59

Extract from: IPCC. *Climate Change 2007*. See the original for further notes, details and explanation. The average estimate is somewhere near 30 to 35 cm rise in 100 years. Add to this at least 10 cm for local downwarping (isostatic rebound) in the Wessex coast area. From this, perhaps about half a metre of sea level rise more might be expected for this local region. Separate evidence suggest a sea-rise at present of about 5mm per annum in the region. This also points towards half a metre for the Wessex coast in 100 years. Of course higher figures are possible. *Ian West, 2007.*



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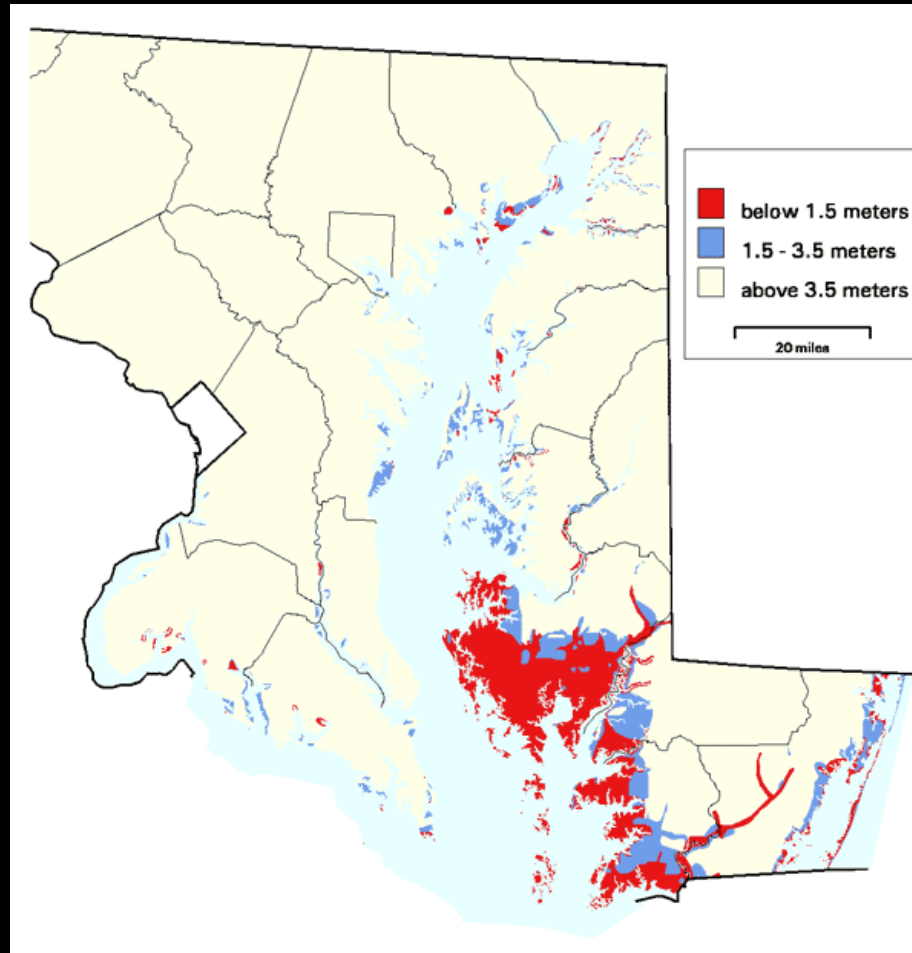




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# Climate Change and Sea Level Rise

## Sea Level Rise Science



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# Climate Change and Sea Level Rise

Interim Report  
to the Governor  
and the  
Maryland General Assembly

## CLIMATE ACTION PLAN



Maryland Commission on Climate Change



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